DS70

SPEAKER DISTRIBUTION SYSTEM

OWNERS MANUAL

SAMSON®

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Congratulations on purchasing the Samson DS70 Speaker Distribution System! The DS70 provides four high-quality toroidal step-up transformers in a single chassis. Each transformer can accept a nominal-level signal from any standard power amplifier, and can then convert it to a 70 volt, 25.2 volt, or 100 volt line-level output for use in paging and public address systems and wherever long cable runs and multiple speakers are required. Particularly well-matched to the Samson Servo Quad 4120 and Servo Quad 4060 power amplifiers (which offer four discrete outputs), the DS70 can also be used with any standard stereo or mono power amplifier delivering a signal of up to 120 watts per channel (into 4 ohms).

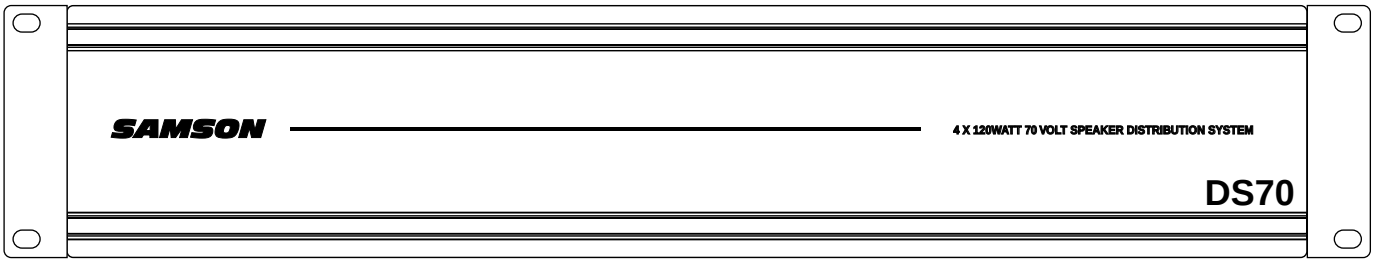
In this manual, we'll provide you with an overview of DS70 features, followed by a guided tour of its rear panel and a general discussion of the theory and application of distributed sound. Also included is a series of wiring diagrams, a block diagram, and full specifications. You'll also find a warranty card enclosed—please don't forget to fill it out and mail it so that you can receive online technical support and so we can send you updated information about this and other Samson products in the future.

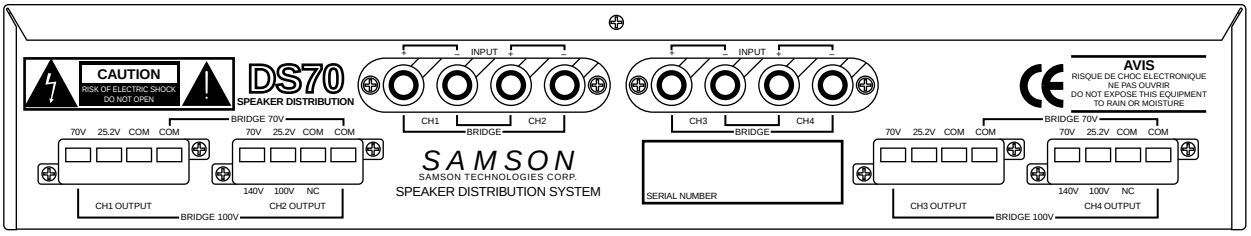
SPECIAL NOTE: Should your DS70 ever require servicing, a *Return Authorization* number (RA) is necessary. Without this number, the unit will not be accepted. Please call Samson at 1-800-372-6766 for a Return Authorization number prior to shipping your DS70. Please retain the original packing materials and, if possible, return the DS70 in its original carton and packing materials.

DS70 Features

- Used in conjunction with quality power amplifiers and speaker transformers, the DS70 delivers audio fidelity far exceeding that usually obtained from high-impedance distributed sound systems.
- No external power required.
- Flexible wiring configuration allows the DS70 to deliver various output level voltages, including 70 volts, 25.2 volts, and 100 volts.
- Four independent channels of operation. Each channel can receive a separate input signal (up to 120 watts) and each can output a signal at any of the available voltages.
- Non-bridged modes of operation deliver up to 120 watts of power to each of four discrete zones. Bridged modes of operation deliver up to 240 watts of power to each of two discrete zones.
- A unique "Bridged 70 Volt" mode enables the use of two discrete transformer-isolated lines which receive the same input signal. This not only allows the level of each zone to be controlled independently, it also ensures that a line failure in one zone does not affect the other one.
- Provision for custom 140 volt output where exceptionally long cable runs are required.
- Binding post inputs and shrouded screw terminal outputs for convenient and reliable connection to power amplifiers and speaker systems.
- Included heavy-duty rack ears allow the DS70 to be mounted in a standard 19" rack (taking just two rack spaces), making it easy to integrate into any existing system.

Guided Tour



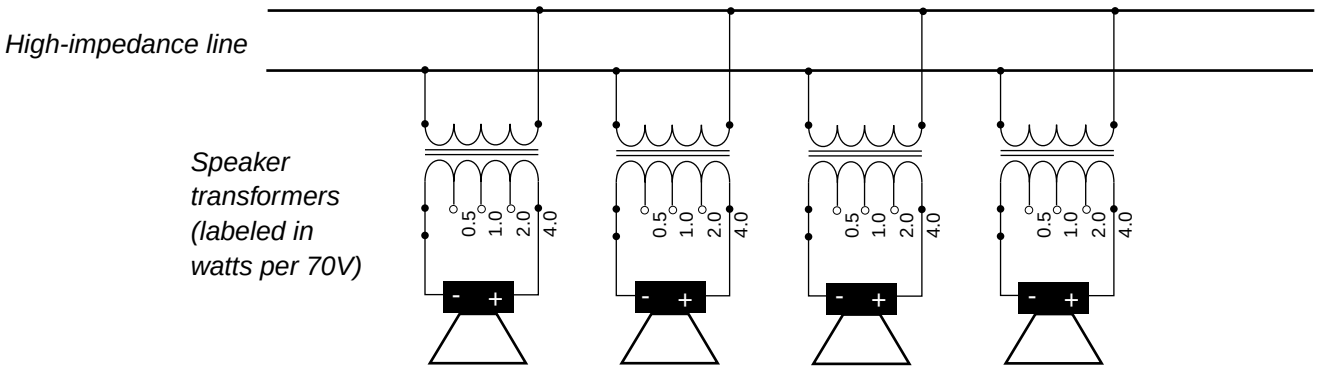


1: Channel inputs (1 - 4) - Connect output signal from a power amplifier to these four sets of binding post input connectors, making sure to follow the polarity markings silk-screened above each connector. When using the DS70 in two-zone (bridged) modes of operation, a bridge connection must be physically made between two channel inputs as silk-screened on the rear panel (i.e., between the negative terminal of the odd-numbered channel and the positive terminal of the even-numbered channel). See the wiring diagrams on pages 6 and 7 in this manual for more information.

2: Channel outputs (1 - 4) - These four sets of screw terminal output connectors are used to send signal from the DS70 to speaker transformers and loudspeakers. When using the DS70 in two-zone (bridged) modes of operation, a bridge connection must be physically made between two channel ouputs as silk-screened on the rear panel. See the wiring diagrams on pages 6 and 7 in this manual for more information.

A distributed sound system (sometimes known as a “constant voltage” system) allows a single power amplifier to drive multiple loudspeakers over a single high-impedance line. Used commonly in public address and paging systems (such as in schools, houses of worship, hotels, factories, stores, and other places of business), distributed sound offers numerous advantages:

- All wiring is in parallel and is therefore simple and straightforward.
- Even if a speaker fails, all other speakers in the system continue operating normally.
- Speakers can be freely added to or removed from the system without affecting the levels of existing speakers in the system.
- As many speakers as are necessary can be used, as long as their total wattage requirement does not exceed the power capacity of the power amplifier or DS70.
- Long runs of inexpensive, thin-gauge cable can be used with minimal signal loss.
- The use of tapped speaker transformers (as shown below) enables different power levels to be selected for each individual speaker, thus providing volume control over different areas.

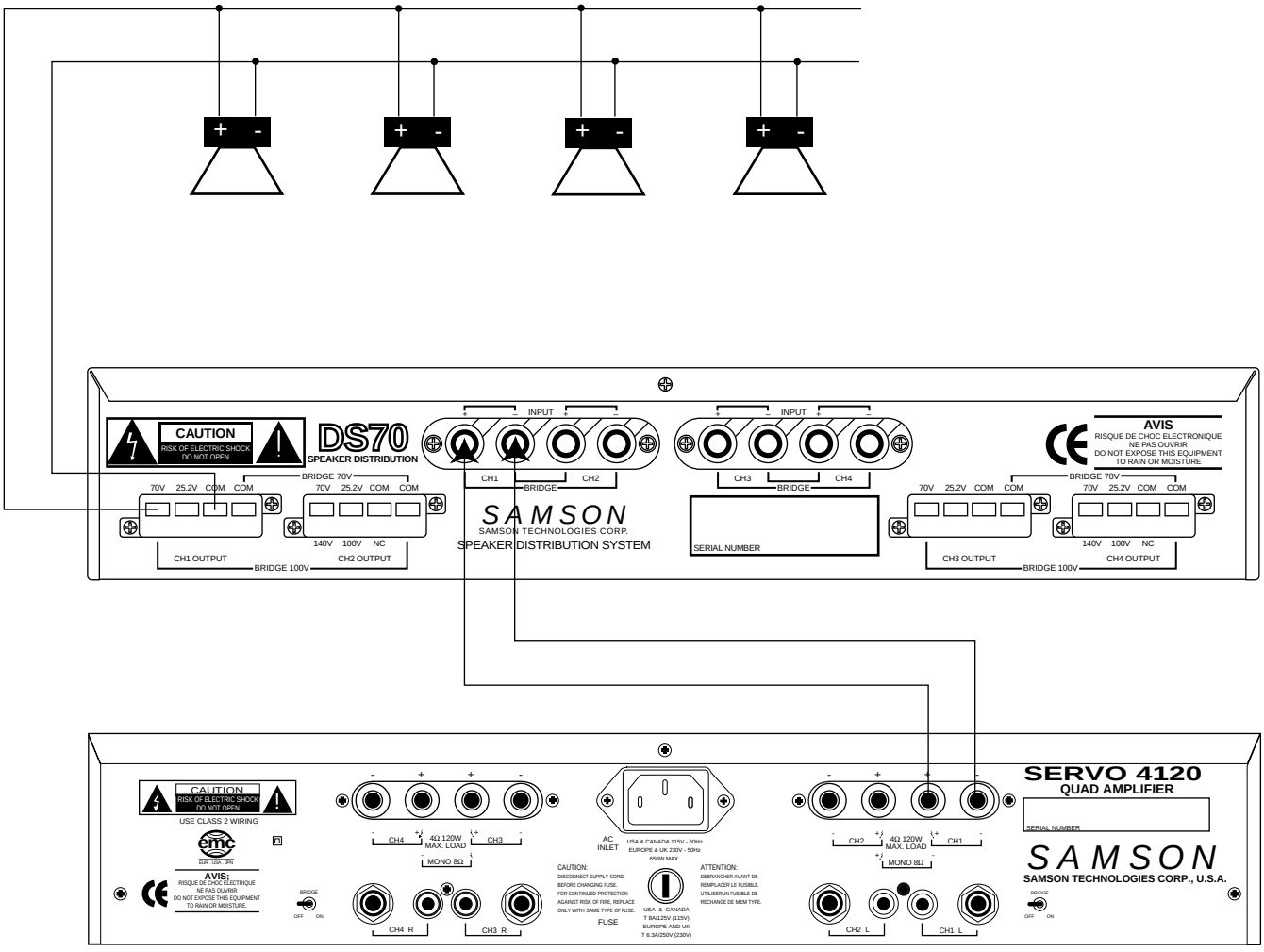


However, because such a system relies greatly on the quality of the speaker transformers, there is a trade-off in terms of reduced low-frequency response. For this reason, many quality power amplifiers cannot be used in distributed sound systems since they provide only low-impedance outputs (typically 8 ohms) in order to deliver full bandwidth to connected speakers. The Samson DS70 is designed to bridge that gap. By providing toroidal step-up transformers that deliver an output voltage that remains constant regardless of load impedance, it allows the finest power amplifiers to be integrated into distributed sound systems. When used in conjunction with quality speaker transformers, the end result is extraordinary audio fidelity.

The most common voltages used by distributed sound systems in the U.S. are 70, 100, and 25.2 (wiring code in the U.S. allows 25.2 volt cabling to be used without conduits), and the DS70 supports all three standards. What’s more, up to four separate lines can be output simultaneously (making for four “zones”)—and they can even be at different voltages. In addition, the DS70 provides a 140 volt output (for use in custom-designed systems where extremely long cable runs are necessary) as well as unique two-zone “Bridged 70 Volt” and “Dual 70 Volt” modes, where two channels output the same input signal. This not only allows the level of each zone to be controlled independently, it also ensures that a line failure in one zone does not affect the other one. Wiring diagrams for all modes of operation are provided on the following pages.

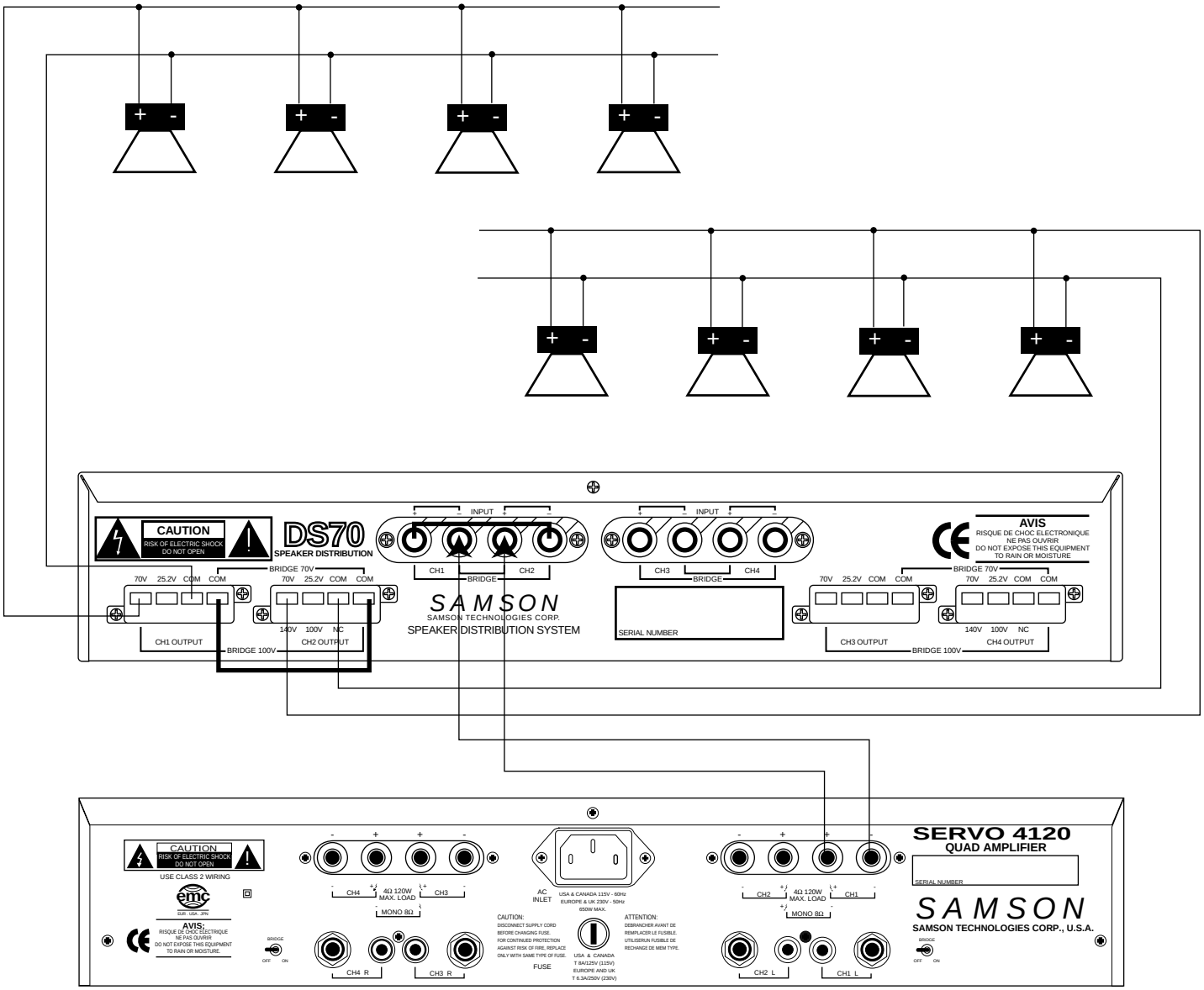
Four-Zone 70V (Unbridged) Wiring

The illustration below shows the wiring for a single channel of a DS70 being used in standard 70 volt mode. In this kind of setup, the output level controls of the power amplifier can be used to control the volumes of each of the four zones. For volume control of each of the speakers within a zone, an optional autotransformer can be used (see Appendix A on page 9 of this manual for more information). Note that four speakers are being used for purposes of illustration only—any number of speakers (up to the rated wattage of the power amplifier or DS70) can in fact be used in each zone. Note also that the the remaining three channels of the DS70 can be used to provide the same or different output voltages.



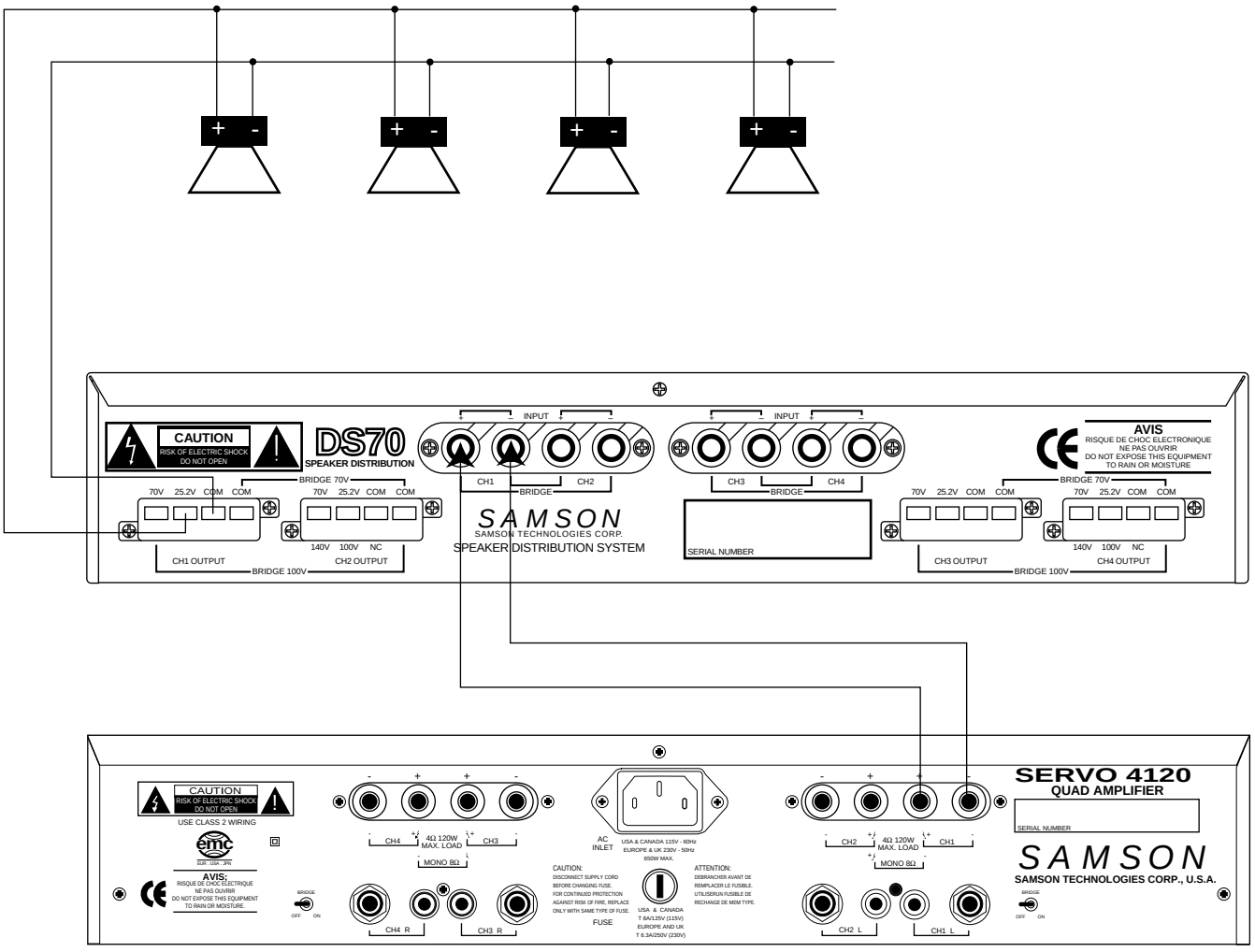
Two-Zone 70V (Bridged) Wiring

The illustration below shows the wiring for two channels of a DS70 being used in Bridged 70 volt mode. Since the two input channels are bridged, a signal of up to 240 watts (into 8 ohms) can be received from the power amplifier. In this kind of setup, the output level controls of the power amplifier can be used to control the volumes of each of the two zones. For volume control of each of the speakers within a zone, an optional autotransformer can be used (see Appendix A on page 9 of this manual for more information). Note that four speakers per channel are being used for purposes of illustration only—any number of speakers (up to the rated wattage of the power amplifier or DS70) can in fact be used in each zone. Note also that the the remaining two channels of the DS70 can be used to provide the same or different output voltages.



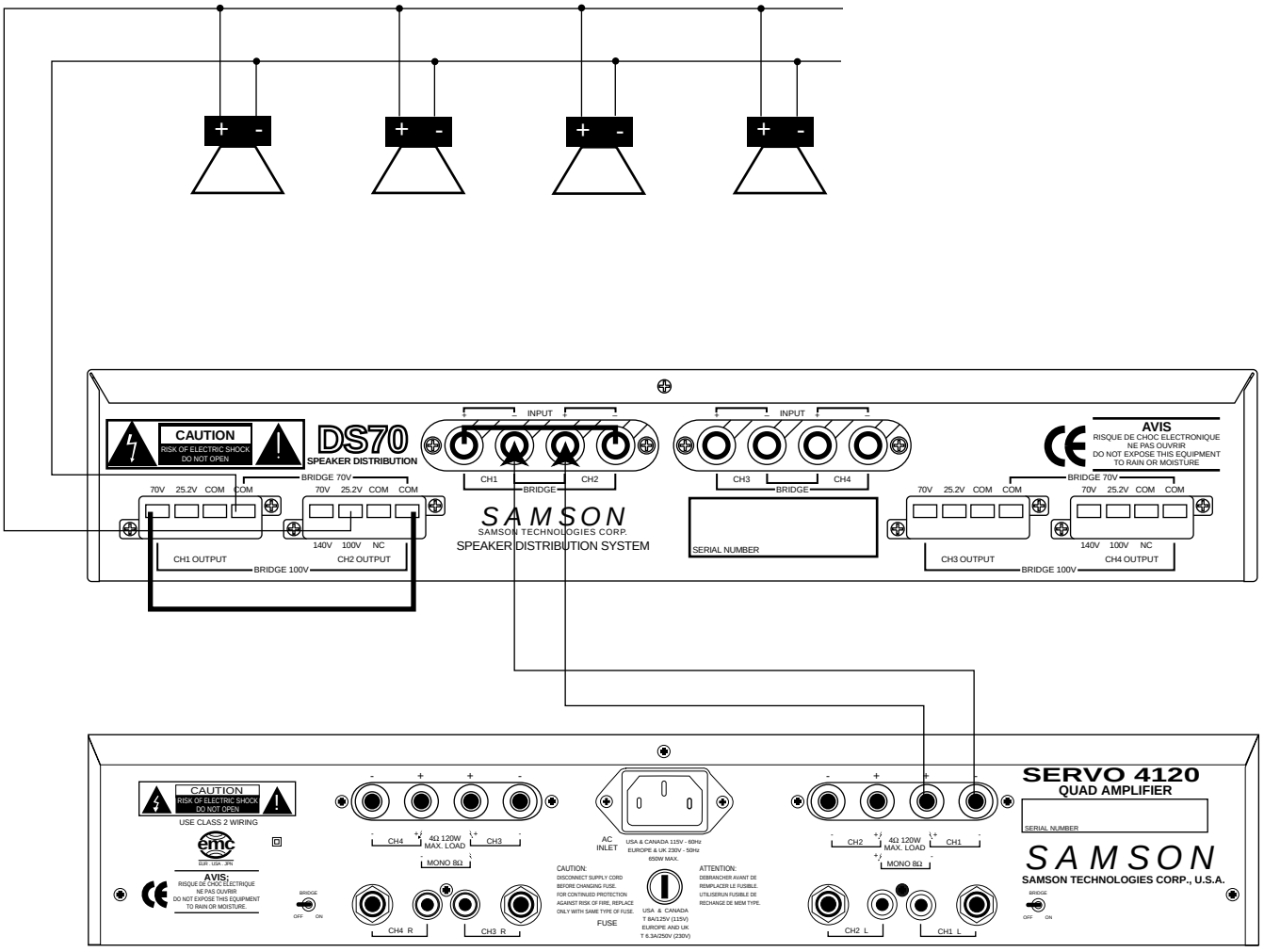
Four-Zone 25.2V (Unbridged) Wiring

The illustration below shows the wiring for a single channel of a DS70 being used in 25.2 volt mode. In this kind of setup, the output level controls of the power amplifier can be used to control the volumes of each of the four zones. For volume control of each of the speakers within a zone, optional autotransformers can be used (see Appendix A on page 9 of this manual for more information). Note that four speakers are being used for purposes of illustration only—any number of speakers (up to the rated wattage of the power amplifier or DS70) can in fact be used in each zone. Note also that the the remaining three channels of the DS70 can be used to provide the same or different output voltages.



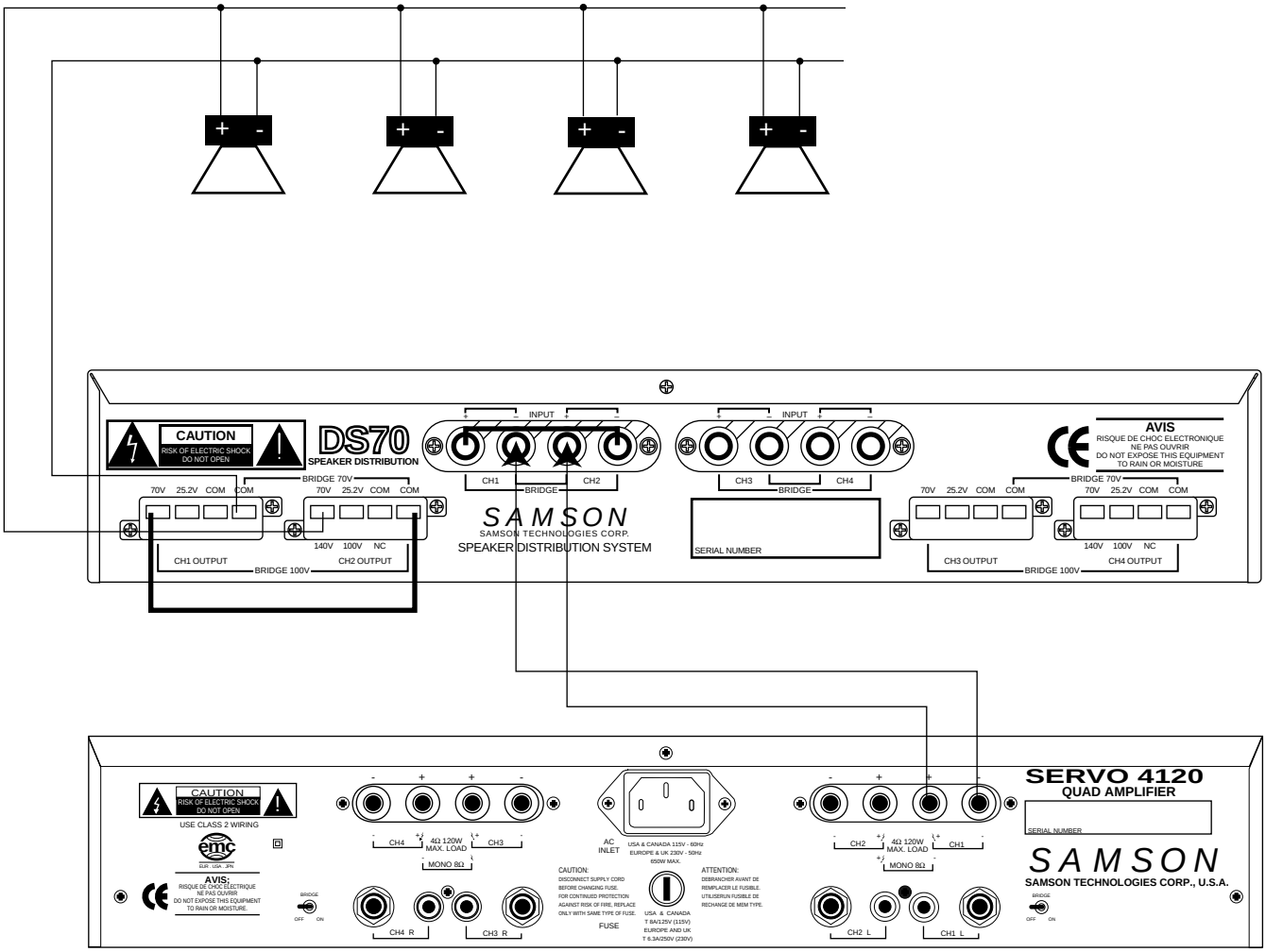
Two-Zone 100V (Bridged) Wiring

The illustration below shows the wiring for a single channel of a DS70 being used in 100 volt mode. Because each transformer within the DS70 can deliver up to 70 volts, so to get a 100 volt output, two of the transformers have to be bridged (i.e., connected in series). Since the two input channels are bridged, a signal of up to 240 watts (into 8 ohms) can be received from the power amplifier. In this kind of setup, the output level controls of the power amplifier can be used to control the volumes of each of the two zones. For volume control of each of the speakers within a zone, optional autotransformers can be used (see Appendix A on page 9 of this manual for more information). Note that four speakers are being used for purposes of illustration only—any number of speakers (up to the rated wattage of the power amplifier or DS70) can in fact be used in each zone. Note also that the the remaining two channels of the DS70 can be used to provide the same or different output voltages.



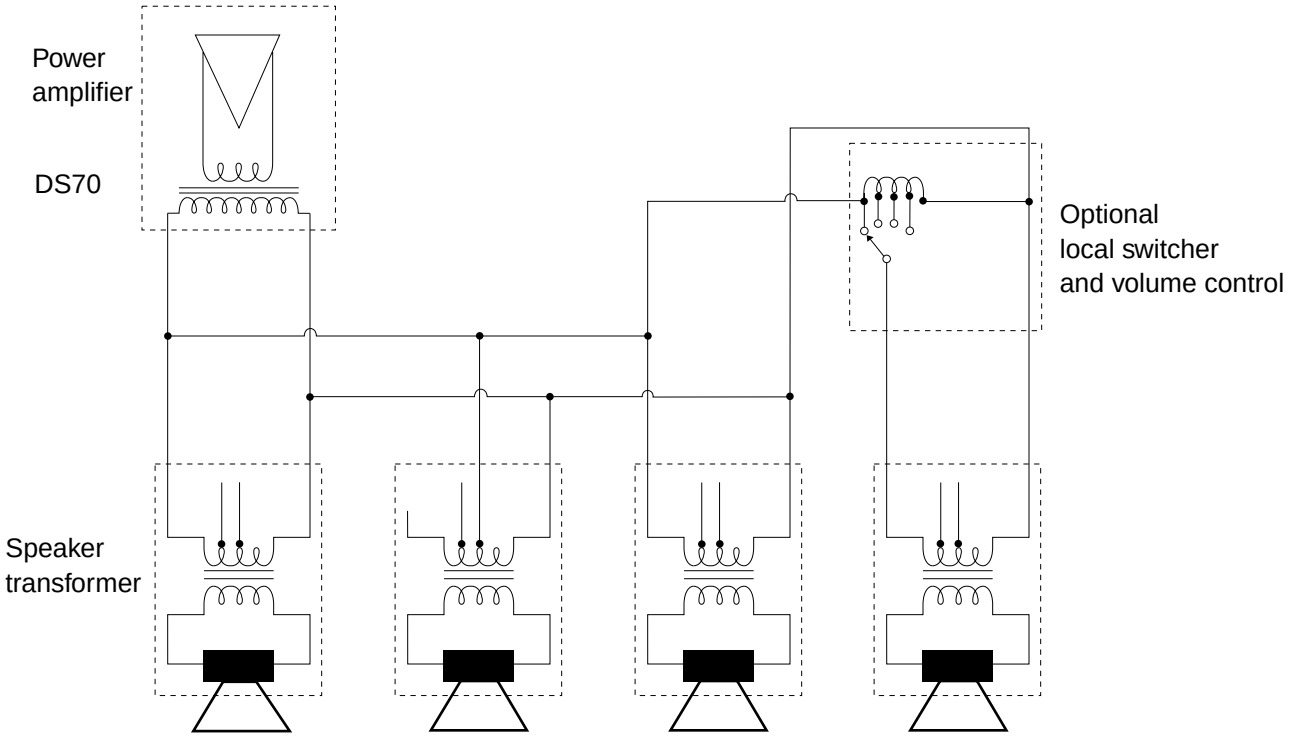
Two-Zone 140V (Bridged) Wiring

The illustration below shows the wiring for a single channel of a DS70 being used in a non-standard 140 volt mode (which can be used with custom equipment where exceptionally long cable runs are required. Because each transformer within the DS70 can deliver up to 70 volts, so to get a 140 volt output, two of the transformers have to be bridged (i.e., connected in series). Since the two input channels are bridged, a signal of up to 240 watts (into 8 ohms) can be received from the power amplifier. In this kind of setup, the output level controls of the power amplifier can be used to control the volumes of each of the two zones. For volume control of each of the speakers within a zone, optional autotransformers can be used (see Appendix A on page 9 of this manual for more information). Note that four speakers are being used for purposes of illustration only—any number of speakers (up to the rated wattage of the power amplifier or DS70) can in fact be used in each zone. Note also that the the remaining two channels of the DS70 can be used to provide the same or different output voltages.



Appendix A: Block Diagram

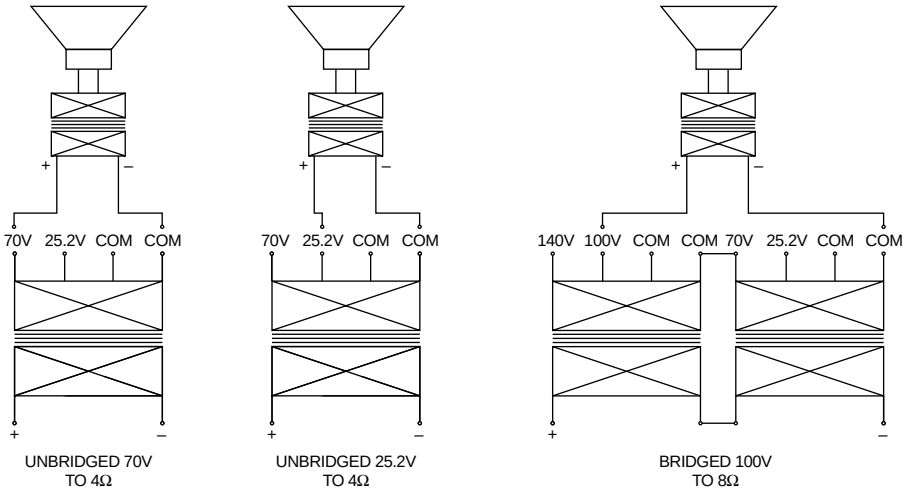
Note: The block diagram below shows the signal flow for a single channel of the DS70.



Specifications

1: Input Impedance	4 Ω (non-bridged modes) 8 Ω (bridged modes) 2 Ω (dual mode)
2: Maximum Power Each Input	120 Wrms (non-bridged modes) 240 Wrms (bridged and dual modes)
3: Output	70 V, 25.2 V (non-bridged), 100 V, 140 V (bridged)
4: Insertion Loss	-0.55 dB @ 1kHz
5: Frequency Response	Flat, +0 dB, -3 dB 20 Hz to 20 kHz, ref. 1 kHz -1 dB, 15 Hz & 9.1 kHz @ 120 Wrms -3 dB, 10 Hz & 20 kHz @ 120 Wrms
6: THD + N	< .04% @ 120 Wrms
7: Dimensions	482 mm (w) x 190 (d) x 88 (h) 19 in. (w) x 7.5 (d) x 3.5 (h)
8: Weight	35 lb. • 18.88 kg

DS70 Modes of Operation:



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